

Remarks/Arguments

Paragraph 2 of the office action of 07/07/2009, rejected Claims 1-3 and 13 as not being described in the filed specification. Specifically stating that “accommodating thermal expansion and contraction or displacing air with fluid . There is no mention of such in the specification as originally filed.”

The following are excerpts from the original application submission of 2/27/2002 from “Detailed Description of Preferred Embodiment, Posted on the USPTO Web Site August 28, 2003.

Paragraph [0018] shows that the invention as claimed was described and included in the original application. fluid thermal expansion “**the heat transfer fluid expands as it heats from 75 degrees Fahrenheit to over 230 degrees Fahrenheit**”, fluid thermal contraction” **the fluid in the solar heat transfer system cools and contracts**” and air displacement “**fluid is drawn back into the heat transfer system to keep it full of fluid and keep air out**”.

The text of the DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT is included here as a reference.

US PATENT & TRADEMARK OFFICE PATENT APPLICATION FULL TEXT AND IMAGE DATABASE



(1 of 1)

United States Patent Application	20030159690
Kind Code	A1
Butler, Barry Lynn	August 28, 2003

Solar heat transfer system (HTPL), high temperature pressurized loop

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

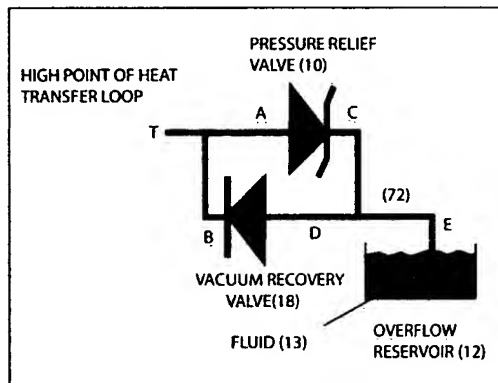
[0018] The invention also consists of a pressure relief and fluid overflow recovery system (FIG. 2). and includes a pressurized fluid reservoir (3), a pressure cap to regulate the pressure in the system, and allow the overflow to return on system cool down at night (2), which is connected to a fluid overflow and recovery reservoir (4). The pressure of the fluid in the solar collector heat transfer loop is regulated by the pressure cap, which uses a spring to push against the fluid pressure over a fixed area. During normal daily operation when the sun is out, the heat transfer fluid expands as it heats from 75 degrees Fahrenheit to over 230 degrees Fahrenheit and when the pressure reaches the set pressure, i.e. 16 PSI, fluid overflows to the fluid overflow reservoir (21), which is vented to the atmosphere by a cap (30). At night, when the fluid in the *solar heat transfer system* cools and contracts, fluid is drawn back into the heat transfer system to keep it full of fluid and keep air out. Air in the system increases the corrosion of the fluid loop. This simple system allows the approximately 50% water/50% antifreeze mixture in the solar heat transfer loop to heat up to over 212 degrees Fahrenheit, without boiling until it reaches almost 265 degrees Fahrenheit, at 16 PSI confinement pressure. This high temperature allows for heat to be transferred more efficiently into the hot water tank, using lower flow rates and an internal (or external) hot water tank heat exchanger.

Paragraph 6 of the office action of 07/07/2009, rejected Claim 1 as being anticipated by Moore (3,661,202) who recites a heat pump system which uses a vapor to transport heat from one surface to another in a closed container, which is filled partially with liquid and the other part with the vapor of the liquid. He recites a sealed system where vapor can not leave and air can not get in. In Figure 16 where heat input 166 vaporizes the liquid and pumps liquid and vapor past the heat flux to condense the vapor and give up its heat to wall 172 and release the heat 190 to a process or other use. Moore recites that no air is let in, because the system is closed. Column 1 line 23-25.

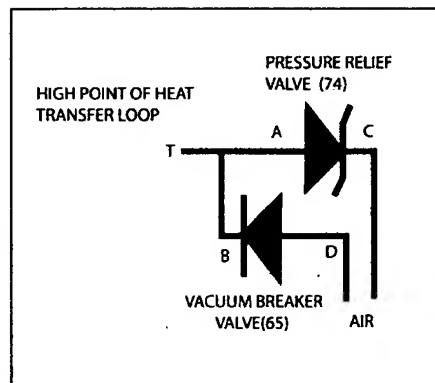
I recite a heat transfer loop where fluid absorbs heat and gets hotter in one part of the loop and gives off that heat at another part of that loop. Moore's loop is hermetically sealed, so no gas or fluid can get in or out. My loop lets liquid out as the fluid expands more than the container and then lets fluid back in as the fluid cools and contracts. My system is not hermetically sealed and hence not closed. Moore does not claim my heat transfer loop.

Paragraph 7 of the office action of 07/07/2009 rejected Claims 2, 3, and 13 as being anticipated by Hardy (4,360,003). I have carefully reviewed the cited patent and believe that my claims are not anticipated by Hardy (4,360,003). Hardy recites a Vacuum Breaker Valve (65) which is defined as a one way valve which lets air into a system when the pressure in the system goes below atmospheric. I recite a vacuum fluid recovery valve

(18), which is a one way valve which lets fluid back into the system when the pressure falls below atmospheric.



CLAIMED BY BUTLER IN HIS FIGURES 2, 6, 7, 8 & 9



CLAIMED BY HARDY IN HIS FIGURE 2.

I have drawn the schematic pictures of my claimed configuration and Hardy's side by side so the differences can be clearly shown. I recite in Figure 2, 6, 7, 8 & 9 a pressure relief valve (10) and a vacuum fluid recovery valve (18), which are in parallel, but both are connected to Overflow Reservoir (13), below the fluid level by pipe (72). In Hardy's arrangement the pressure relief valve 74 discharges water/steam into the air and onto the floor and the vacuum breaker valve 65 draws only air back into the closed loop to prevent boiler reservoir non-potable water backflow into the domestic water fluid loop through float valve 69. I submit that Hardy has parallel pressure relief 74 and vacuum "breaker" relief 65 valve which go from the fluid loop to the atmosphere, which is fundamentally different from the parallel pressure relief (10) and vacuum "fluid recovery" relief (18) valves which go from the fluid loop to below fluid level in the overflow reservoir (12) which I have recited, hence Hardy has not anticipated my invention. In my Figure 2 above A, B & T are all tied together. The same is true for Hardy's Figure 2 above. In my patent application C & D are tied to E, which extends below the fluid level in the overflow reservoir (12). In Hardy's patent, C & D are not tied together and each vents separately to the air. The vacuum breaker (65) pipe D allows air to enter the loop if it is un-pressurized. The pressure relief (74) pipe C allows water and steam to escape, to the air, but will not let any fluid back into the heat transfer loop.

I recited a vacuum fluid recovery valve (18), which is not the same as Hardy's vacuum breaker valve 65. Both valves fall under the general category of vacuum relief valves. A vacuum fluid recovery valve (18) has its inlet below the water level of a fluid reservoir. **My Specification, DETAILED DESCRIPTION OF PREFERRED EMBODIMENT, Par. 1, lines, 9-11** "to a pressure relief valve (10) which includes a vacuum recovery valve to let expelled heat exchanger fluid (13) back into the system from the fluid overflow/recovery reservoir (12), while excluding non-condensable air." A vacuum

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breaker valve **65** must have its inlet open to air to prevent contamination of domestic water with non-potable water. **Hardy col. 5 lines, 5-11** "Placed on inlet **64** is vacuum breaker **65** such as a vacuum relief valve of conventional construction and as commonly commercially available from sources such as from Hardy Manufacturing Company, Inc., Route 4, Box 156, Philadelphia, MI 39530 and others, the breaker to prevent accidental siphoning of tank water into the home water supply". I submit that Hardy has a vacuum breaker valve **65** on his domestic water loop, since its function is fundamentally different from the vacuum fluid recovery valve (18) which I have recited, hence Hardy has not anticipated my invention..

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "Barry L. Butler". The signature is fluid and cursive, with the first name "Barry" being the most prominent.

Dr. Barry L. Butler
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